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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,680	09/14/2001	Peter Cox	5977-01-SD	8893

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EXAMINER	
BASI, NIRMAL SINGH	
ART UNIT	PAPER NUMBER
1646	

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/936,680	COX ET AL.	
	Examiner	Art Unit	
	Nirmal S. Basi	1646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5, 10-13, 17, 20, 24-28 and 39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5,10-13,17,20,24-28 and 39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/1/04* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action (12/17/03).

2. Amendment filed 4/1/04 has been entered.

3. The abstract, submitted 4/1/04, is approved by the examiner.

4. The drawings were received on 4/1/04. These drawings are approved but in addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as "Annotated Marked-up Drawings" and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Objections

The disclosure remains objected to because of the following informalities:

5. Applicants are required to use the heading "Brief Description of the Drawings" to describe the drawings. See MPEP 608.01(f). The heading "Brief Description of the Drawings" to describe the drawings is not present in the specification. Figures 3, 6, and 7 must also be described in the Brief Description of the Drawings as Figure 3A-I, Figure 6A-C, Figure 7A-B. Applicant argues Figures 3, 6 and 7 are sufficiently described under the "Brief Description of the

Drawings" as sufficient detail is provided with this regard to the figures and the figures are adequately annotated. Applicants' arguments have been fully considered are but not found persuasive. The Figure descriptors of Figure 3A-I, Figure 6A-C and Figure 7A-B are not contained in the "Brief Description of the Drawings"

Appropriate correction is required.

Claim Rejections - 35 USC § 101 and 35 USC § 112, 1st paragraph

6. Claims 5, 10-13, 17, 20, 24-38 and 39 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility. The rejection of claims 5, 10-13, 17, 20, 24, 27-28, mailed 11/17/03, is applied to amended claims 5, 10-13, 17, 20, 24, 27-28. Original claims 25-26 remain rejected for the reasons of record disclosed in the Office Action mailed 11/17/03. Newly added claim 39 is rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility and is rejected for the same reasons as those described for rejected claims 5, 10-13, 17, 20, 24-38 and 39 (Office Action mailed 11/17/03).

Applicants argue and specifically state, "The invention provides for methods of screening for agonist and antagonist molecules or substances of sodium channels (see e.g., page 35, line 30, bridging to page 36, line 5). Thus, the claimed nucleotides can be used to create recombinant cells that can be used to screen for therapeutic pharmaceuticals that can be used as anti-

convulsants. Claims 1, 3, 14, and 18 have been canceled. As such, Applicants respectfully submit that claims 5, 10-13, 16-17, 20, and 24-28 are supported by a specific and credible utility. Accordingly Applicants respectfully request that this rejection under 35 U.S.C. 112, 2nd paragraph be withdrawn".

Applicants' arguments have been fully considered but are not found persuasive. Applicants have argued Examiners rejection under the heading of "Rejection under 35 USC § 101" but requested the rejection be withdrawn under 35 U.S.C. 112, 2nd paragraph. The record is not clear pertaining to Applicants' arguments. Even if Applicants are arguing withdrawal of the rejection under 35 USC § 101, applicant's arguments have been fully considered but are not found persuasive. The methods of screening for agonist and antagonist molecules or substances of sodium channels and the use of the claimed nucleotides to create recombinant cells that can be used to screen for therapeutic anti-convulsant pharmaceuticals is not considered to provide a either a specific and substantial asserted utility or a well established utility for the claimed invention.

The methods of screening for agonist and antagonist molecules would only identify ligands that interact with the claimed ion channel. There is no disclosure of the therapeutic effects of these ligands on the claimed ion channel. Further research is required to determine agonists and antagonists can be used as therapeutic pharmaceuticals that function as anti-convulsants. The specification fails to disclose, what specific disease is associated with claimed β3 sub-unit dysfunction or what drugs affect a specific claimed receptor function. The claims, specification, nor prior art disclose the ligand that binds the claimed

β3 sub-unit, the activity associated with the claimed β3 sub-unit, how the activity is modulated, and how the modulation or activity is determined. The claimed β3 sub-unit may have utility in the future, when it has been further characterized (e.g. its dysfunction or function correlated with a disease state), its ligand characterized and functionality determined. The agonists and antagonist of the claimed invention may be useful in the future when they are further characterized (e.g. its dysfunction or function correlated with a disease state). This all requires further research. The inclusion in the family of sodium transporters does not constitute either a specific and substantial asserted utility or a well-established utility for the claimed β3 sub-unit. This is analogous to all proteins/nucleic acid of sodium transporters can be used as markers on a gel. Specification discloses claimed receptors are useful in screening but the specification does not disclose what claimed β3 sub-unit specifically regulates and what specific disease, claimed β3 sub-unit, and is a target for. What would be the use of using the claimed β3 sub-unit on a panel for drug screening? The β3 sub-unit has no known ligand or known function. How would one use the compounds that interacted with said orphan β3 sub-unit? The specification provides a diverse list of disease states that may be involved in claimed β3 sub-unit dysfunction. It is unpredictable what ligands will bind to orphan β3 sub-unit. The ordinary artisan can only speculate on the utility for the ligand and β3 sub-unit. A utility to orphan β3 sub-unit cannot be assigned without knowledge of

what disease is associated with claimed $\beta 3$ sub-unit dysfunction or what drugs/ligands effect a specific claimed $\beta 3$ sub-unit function. All members of the sodium transporter family have a utility in selectively screening of candidate drugs that target sodium transporters. However, for a utility to be "well-established" it must be specific and substantial. The particulars of screening of candidate drugs that target claimed $\beta 3$ sub-unit are not disclosed in the instant specification. Therefore, this is a utility which would apply to virtually every member of a general class of materials, such as any collection of proteins or DNA, but is only potential with respect to SEQ ID NO: 2 and 4. Because of this, such a utility is not specific and does not constitute a "well-established" utility. Further, because any potential diagnostic utility is not yet known and has not yet been disclosed, the utility is not substantial because it is not currently available in practical form. Moreover, use of the claimed $\beta 3$ sub-unit for screening compounds that are a target for claimed $\beta 3$ sub-unit is only useful in the sense that the information that is gained from the assay and is dependent on the effect it has on the protein, and says nothing with regard to each individual member of the $\beta 3$ sub-unit family. Again, this is a utility, which would apply to virtually ever member of a general class of materials, such as any collection of proteins or DNA. Even if a test compound in an assay for drug screening affects the expression of Applicants' individual $\beta 3$ sub-unit, the specification does not disclose any specific and substantial interpretation for the result, and none is known in the art. Given this consideration, the individually claimed method of

using claimed β3 sub-unit has no "well-established" use. The artisan is required to perform further experimentation on the claimed β3 sub-unit itself in order to determine to what "use" any information regarding this protein β3 sub-unit could be put.

Therefore, in the absence of any disclosed relationship between the claimed β3 sub-unit and any disease or disorder and the lack of any correlation between the claimed β3 sub-unit with any known disease or disorder, any information obtained from an expression profile would only serve as the basis for further research on the observation itself. "Congress intended that no patent be granted on a chemical compound whose sole 'utility' consists of its potential role as an object of use-testing." *Brenner*, 148 USPQ at 696. The disclosure does not present a utility that would support the requirement of 35 U.S.C. §101.

7. Claims 5, 10-13, 17, 20, 24-38 and 39 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention. Since neither the specification nor the art of record disclose any activities or properties that would constitute a "real world" context of use for the invention of claims 5, 10-13, 17, 20, 24-38, 39 variants thereof and kits comprising claimed nucleic acid further experimentation is necessary to attribute a utility to the claimed nucleic acid encoding claimed ion channel.

The rejection of claims 5, 10-13, 17, 20, 24, 27-28, mailed 11/17/03, is applied to amended claims 5, 10-13, 17, 20, 24, 27-28. Original claims 25-26 remain rejected for the reasons of record in the Office Action mailed 11/17/03. Newly added claim 39 is rejected under 35 U.S.C. 112, first paragraph because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility and is rejected for the same reasons as those described for rejected claims 5, 10-13, 17, 20, 24-38 and 39 (Office Action mailed 1/17/03).

Applicants argue that the claimed invention can be carried out with out undue experimentation. First the claimed invention is supported by a specific and credible utility. Moreover, one of skill in the art can make and use the claimed nucleotides. That some experimentation and screening of nucleotides may be necessary does not mean that the claims are not enabled, as such screening is routine in the art. In addition, Applicants respectfully submit that new claim 39 which does not contain an identity limitation is enabled. Applicants maintain that the claims, as amended, are sufficiently enabled under 35 U.S.C. 112, first paragraph. Accordingly Applicants respectfully request that the enablement rejection under 35 U.S.C. 112, first paragraph be withdrawn. Applicants' arguments have been fully considered but are not found persuasive. The claimed invention is supported by a specific and credible utility for the reasons given above and provided in the prior Office Action. The claimed invention cannot be carried out without undue experimentation for the reasons given above and provided in the prior Office Action.

Since the claimed invention is not supported by either a specific or substantial asserted utility or a well established utility, one skilled in the art would not know how to use the claimed invention so that it would operate as intended without undue experimentation.

Claim Rejection 35 USC § 112, 1st paragraph (Written Description)

8. Claims 5,10-13, 27-28 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The rejection of claims 5,10-13, 17, 20, 24-28, mailed 11/17/03, is applied to amended claims 5, 10-13 and 27-28.

Applicants argue that claims 5,10-13, 17, 20, 24-28, as amended, recite sufficient structural limitations to be adequately described under 35 U.S.C. 112, first paragraph. Applicants also argue that claims 5, 10-13 and 24-28 now recite sufficient structural limitations to comply with the written description requirement. All of the claims contain a chemical structure (e.g., SEQ ID NO: 2 in claim 5). Thus, the claimed genus of nucleotides has been narrowed to the currently amended claims. Applicants maintain that the combination of the structural features of the nucleic acids recited in the claims, provides sufficient detailed, relevant identifying characteristics to adequately convey to one of skill in the art that the Applicants were in possession of the claimed invention at the time the application was filed. Accordingly, Applicants respectfully request that the written description rejection under 35 U.S.C. 112, first paragraph.

Applicants arguments have been fully considered are but are not found persuasive. All of the claims do not contain a chemical structure limited to SEQ ID NO: 2. Claims are directed to an isolated nucleic acid molecule encoding $\beta 3$ sub-unit of a voltage gated sodium channel comprising: a) nucleic acid molecule encoding a polypeptide at least 80% identical to SEQ ID NO: 2 or its complement, b) nucleic acid at least 90% identical to SEQ ID NO: 4 and c) vector comprising a or b. The claims encompasses nucleic acid molecules encoding variants of the protein disclosed in SEQ ID NO: 2, said variants may be completely unrelated, structurally and functionally to the protein encoded by SEQ ID NO: 4.

The common function of the nucleic acid (SEQ ID NO: 4) encoding the polypeptide (SEQ ID NO: 2), which is based upon a common property or critical technical feature of the genus claimed, is not disclosed. The claims, as written, encompass nucleic acid encoding polypeptides, which vary substantially in length and also in amino acid composition. The instant disclosure of a polynucleotide of SEQ ID NO: 4 encoding the polypeptide of SEQ ID NO: 2 does not adequately describe the scope of the use of the claimed genus. The genus encompasses a substantial variety of subgenera including polynucleotides encoding full-length proteins, comprising fragments of SEQ ID NO: 4, variants encoding polypeptides of SEQ ID NO: 2, chimeric constructs, fusion constructs. The variants which may encode polypeptides completely, unrelated functionally to the polypeptide of SEQ ID NO: 2. In the current instance, there is no clear evidence of the activity possessed by the claimed genus of nucleic acid molecules encoding variant $\beta 3$

sub-unit polypeptides, the critical special technical feature of the polypeptides or how the critical special technical feature encompassed by the genus claimed relates to function. Because of the lack of guidance in the prior art and current application, one skilled in the art could not predict if the variants $\beta 3$ sub-unit have the same activity as the protein disclosed in SEQ ID NO: 2, or if they contain the domain(s) of SEQ ID NO: 2, containing the critical special technical feature of the claimed $\beta 3$ sub-unit, since no critical special technical feature is disclosed. The claims remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention for reason disclosed in the prior Office Action.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 17, 20, and 24 are rejected under 35 U.S.C. 102(a) as being anticipated et al by Agostino et al (WO9845435 provided by Applicants).

Agostino discloses an isolated clone, which has at least 10 consecutive nucleotides of SEQ ID NO: 4. The polynucleotide of Agostino has

25.7% query match and 100% local similarity to SEQ ID NO: 4 (see previous Office action). The disclosure of Agostino meets the limitations of claims 17, 20, and 24, absent evidence to the contrary.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nirmal S. Basi whose telephone number is 571-272-0868. The examiner can normally be reached on 9:00 AM-5: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz can be reached on 571-272-0887. The fax

phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nirmal S. Basi
Art Unit 1646
June 28, 2004

GARY KUNZ
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